PROGRESS REPORT

GRANT NUMBER: 7310035
High Capacity Airborne Wind Turbine
Altaeros Energies
8/1/2015 – 10/31/2015

Deliverables Submitted
No official deliverables were scheduled to be submitted this period.

Budget
No costs were submitted for this period.

Schedule Status
After finalizing the initial BAT30 design, we developed and tested a mini-BAT shell prototype in Loring, Maine, to evaluate its performance. In addition, our airspace permitting application has been reviewed by nine out of ten obstruction evaluation groups, and we expect to receive a comprehensive feedback report.

Percent Complete

Tasks/Milestones	Start Date	End Date	Percent Complete
Task 1: Final site selection, permitting, and community forum	Mar-13	Jun-16	70%
Task 2: 30 kw turbine assembly and testing in Maine	Jul-13	Sep-16	35%
Task 3: Complete instrumentation plan and shakedown test plan	Jul-13	Sep-16	30%

Work Progress

Task 1:

- Cost Share Complete.

- Permitting
  - As written in the previous report, expected FAA approval window was pushed from the original August target into the fall. No timetable has been given by the FAA at this time.

  - Altaeros last spoke with the FAA's Obstruction Evaluation Group to obtain information on the project's application status. The officer in the group, Bill Kiefer informed us that 9 of 10 evaluation groups have submitted their feedback report. The remaining group, Flight Standards, is outstanding with no timetable available. Lighting and marking is expected to be the greatest concern as mentioned by Mr. Kiefer.

  - Altaeros also learned that airborne wind energy systems will be determined under Part 77 and not Part 101 of FAA standards.

- Community Assessment
  - Altaeros continues to work with the Pease International Airport in New Hampshire as a top priority site for local testing prior to deployment in Alaska. Pease administrators are now reviewing our proposal to use airfield and hangar facilities for local testing, which would replace the Maine test site with a site closer to our Boston headquarters. We maintain access to our Maine test site as a backup as needed. We are in the final stages of negotiating a first phase lease of hangar space at Pease. This will be a nine month term, with the option for an extension beyond that. We have

received permission to operate up to 599 ft during daylight hours, and will coordinate all operations with Pease personnel.

- We continue to explore Fort Devens as a local test site as well. We are awaiting feedback from Fort Devens regarding mandatory upgrades required at the facility. Once we receive this information we can resubmit our letter requesting to lease the test site, which will begin the licensing process to use the site. We expect to get approval to operate at the Devens test site by summer 2016.

Task 2:

- 30 kw turbine assembly and testing.
  - Detailed design and development of a number of key components is being outsourced to domain experts, including
    - Wind turbine and generator
    - Inflatable shell structure
  - Power converters (combination of commercially available and custom) The development schedule for all major components has been validated with the key vendors who will be assisting with the design and fabrication of the pilot unit. At present, the wind turbine system has the highest risk of schedule overruns. It is expected that if the turbine is delayed, the rest of the system will be fully tested prior to integration of the turbine, in order to minimize the overall program setback.

Task 3:

- Test experience and data from the recent prototype continues to inform the development of the commercial BAT30 for this project.

Future Work

Task 1:

- Site Selection
  - Preliminarily completed (Eva Creek), unless future permitting problem arises.

- Permitting
  - Continue to work with FAA and airspace consultants to complete FAA aeronautical evaluation of Eva Creek site.
  - Continue formulating permitting strategy for Fish & Wildlife approval of Eva Creek Site.

- Community Assessment (after FAA permitting)
  - Initiate follow up conversations to test hypothesis of no community concerns at Eva Creek site, and evaluate need for a Community Forum.

Task 2:

- Complete Alaska prototype full pilot design
  - Complete and freeze full high level system design
  - Complete generator selection and rotor/turbine design.
  - Complete design of ground station and final winch and tether selection.
  - Update controls and communication system, including remote monitoring and data collection.
  - Implement fault detection and handling capabilities.

- Work to improve total system reliability.

Task 3:

- Instrumentation plan and shakedown test plan
  - Develop initial test plan for 30kW turbine after design completed.